PROGRESS IN SURFACE SCIENCE, VOLUME 30

AUTHOR INDEX

Acuna, A.U. 193
Aers, G.C. 227
Aghion, J. 195
Aizawa, M. 192, 197
Alamuti, N. 195
Aldao, C.M. 230
Allan, G. 227
Allen, L.R. 227
Anderson, S.B. 228
Andersson, S. 229
Anzai, J.-I. 192
Arantono, M. 354
Aratono, M. 354, 355
Archer, M.D. 193
Arents, J.C. 198
Arrieta, I.C. 198
Arrieta, R.T. 198
Arvanitis, D. 227
Arvidson, G. 193
Aso, Y. 195
Aten, R.M. 227
Avery, N.R. 230
Azuma, K. 197

Baberschke, K. 227, 228
Bacon, K. 195
Baddorf, A.P. 227
Bader, S.D. 230
Bahr, C.C. 227, 229
Balerna, A. 228
Bamberg, E. 196, 197, 198
Bangham, A.D. 191, 195
Baral, S. 199
Bardeen, J 226
Bardi, U. 229
Bardolle, J. 229
Bare, S.R. 231
Barenholz, Y. 195
Baret, J.F. 356
Barker, R.A. 227
Barnes, C.J. 228
Baron, K. 231
Barsky, E.L. 196
Barton, J.J. 227, 229
Bastard, G. 192
Bastasz, R. 230
Baudoing, R. 227
Bauer, E. 230, 231
Bauer, P.J. 197
Bauman, J. 195
Bauschlicher, C.W., Jr. 231
Becker, R.S. 228
Bedair, S.M. 230
Bedzyk, M. 228
Behm, R.J. 227, 228, 229,
Bellemans, A. 226
Bensasson, R.V. 193
Beretrand, O. 230
Bernhardt, P. 231
Berns, D.S. 194
Bertolini, J.C. 229
Besold, G. 229
Bhardwaj, C. 199
Bhardwaj, R. 191, 199
Bhise, S.B. 192
Bhowmik, B.B. 192
Bi, Z.-C. 192
Bialek-Bylka, G.E. 196
Bibérian, J.P. 229
Bickel, N. 227, 228
Biddle, D. 199
Bienvenue, E. 193, 196, 197, 198, 199
Blakely, J.M. 229, 231
Blakley, D.W. 231
Blok, M.C. 197
Bockris, J.O'M. 199
Bogomolini, R.A. 191
Boguslavsky, L.I. 192
Bolszakov, V.I. 193
Bolton, J.R. 192, 193
Bonapace, C.R. 229
Bönczek, F. 231
Bonzel, H.P. 229
Boruvka, L. 356
Bouillard, J.C. 231
Bouwmann, R. 230
Bowker, M. 230
Bradshaw, A.M. 228
Brann, M.R. 196
Brasseur, R. 196
Brennan, S. 229
Breton, J. 194, 194
Bridgman, P.W. 355

Brillson, L. 230
Brochette, P. 192
Brodén, G. 228
Brodmann, W. 195
Brody, S.S. 196
Brooks, R. 229
Brown, J.S. 192
Brown, K.T. 197
Brundle, C.R. 229
Buck, R.P. 355
Buff, F.R. 356
Bujor, M. 229
Burnham, V.G. 198
Burton, W.K. 226

Cabrera, N. 226
Calvin, M. 194, 196, 199
Campbell, C.T. 230
Carelli, J. 229, 230
Carière, B. 230
Carrazza, J. 231
Castelli, F. 195
Castner, D.G. 229, 231
Chabal, Y.J. 228
Chambers, S.A. 228
Chan, C.-M. 227, 228
Chan, H. 194
Chandesris, D. 228
Chang L.I. 192
Chang, S.-L. 230
Chapman, D. 195
Chapoy L.L. 199
Chekulayeva, L.N. 198
Chen, J. 199
Chen, Q.-S. 195
Cherry, R.J. 195
Chesters, M.A. 230
Chiang, S. 228
Chismadzhev, Yu.A. 198
Chiu, K.C.R. 230
Citrin, P.H. 229
Clabes, J.G. 230
Clarke, L.J. 227
Clarke, R.M. 195
Clayton, R.K. 194
Cogniaux, R. 195
Colmenares, C.A. 230
Colson, J.C. 230
Comsa, G. 228, 231
Cone, R.A. 197
Connolly, J.S. 193
Conrad, E.H. 227
Conrad, H. 229, 230
Copel, M. 228
Corker, G.A. 194
Covindjee, R. 197
Cox, D.M. 231
Cramm, S. 228
Criddle, R.S. 197
Cross, W.H. 196
Cruz, C.H.B. 197
Csatorday, K. 192
Csorba, I. 194
Cullis, A.G. 230
Cyr, D.M. 228
Czech, B. 195

Daley, R.S. 228
Dalmai-Imelik, G. 229
Dalton, J. 193
Dam, R.J. 192
Damaskin, B.B. 355
Dancshazy, Z. 196, 197, 198
Dartnall, H.J.A. 191
Darville, J. 229
Daum, W. 227
Davie, P.J. 228
Davies, J.A. 229
Davis, H.L. 227, 230
Davis, S.M. 231
Defay, R. 226
Deischhofer, J. 194
Demuth, J.E. 228
den Nijis, M. 227
Dencher, N.A. 198
Derrien, J. 230
Derry, G.N. 229
Derry, T.E. 228
Dervan, P.B. 193
Dev, B.N. 228
DeVault, D. 192
Deville, J.P. 230
Diehl, R.D. 228
DiFiore, D. 195
Dijkmans, H. 195
Dilley, R.A. 197
Ding, M.Q. 228
Diniz, F.B. 199
Dirks, G. 193
Döbler, U. 228
Dodelet, J.P. 195
Doetsch, B. 227
Domange, J.L. 229
Doram, K. 195
Dowben, P.A. 230
Dracher, L.A. 196
Drachev, L.A. 198
Dragsten, P.R. 198
Dratz, E.A. 196
Ducros, R. 229, 230
Dufour, L.C. 230
Duke, C.B. 229, 230

Dumas, P. 230
Dupeyrat, M. 192, 355
Dutton, H.J. 192
Dwyer, D.J. 229
Dyukova, T.V. 196

Ebina, A. 229
Ebrey, T.G. 197
Echenique, P.M. 229
Eff, O. 194
Ehrenberg, B. 195
Einstein, T.L. 228
Eisenberger, P. 229
Eissler, R.L. 192
Eiswirth, M. 231
Ekelund, S. 229
El-Sayed, M.A. 197
Engberts, B.F.N. 195
Engel, T. 227, 231
Erdei, L. 194
Eriksson, J.C. 355
Erley, W. 229
Erokhina, L.G. 192
Ertl, G. 228, 229, 231
Esaki, L. 192
Escabi-Perez, J. 195
Estrup, P.J. 227
Everett, D.H. 226, 355
Evstigneeva, R.P. 198

Fabre, F. 227
Fadley, C.S. 229, 231
Fahr, A. 197, 198
Fain, G.L. 196
Fajszi, Cs. 194
Falk, G. 197
Farkas, D.L. 195
Farrell, H.H. 229
Fast, P.G. 195
Fatt, P. 197
Feidenhans'l, R. 228
Felker, P.K. 193
Fendler, J. 195
Fendler, J.H. 199
Fendler, K. 196
Ferrer, S. 229
Fesenko, E.E. 196, 197
Filpo, J.L. 356
Fleming, G.R. 194
Floquet, N. 230
Fluhler, E. 198
Fluhler, E.M. 195
Flynn, D.K. 228
Foord, J.S. 230
Ford, W.E. 194, 196
Ford, W.K. 229
Foster, M.S. 227
Foulias, S.D. 228
Fowler, D.E. 229
Frackowiak, D. 192
Fragata, M. 195
Frank, F.C. 226
Frenken, J.W.M. 227, 228, 230
Friedel, J. 226
Frost, D.C. 227
Frumkin, A.N. 355
Fujinaga, Y. 230
Fujishima, A. 192, 196
Fukumoto, J.M. 197
Funke, P. 228

Galla, H.J. 195
Gambale, F. 197
Gartner, W. 196
Gauthier, Y. 227
Gavach, C. 197, 198, 356
Gellman, A. 231
Gellman, A.J. 231
Gerischer, H. 192
Geusic, M.E. 231
Gewinner, G. 230
Gibbs, J.W. 226, 354
Gibson, W.M. 228
Gilles, J.M. 229
Girault, H.H. 355
Gliozzi, A. 194, 197
Goldmann, A. 227
Gonzalez-Rodrigues, J. 193
Good, R.J. 354
Gopal-Ayengar, A.R. 194
Gorse, D. 227
Govindjee, R. 193
Graber, P. 192
Graham, M.J. 229
Graham, W.R. 228
Grahame, D.C. 356
Grandke, T. 229
Grant, J.T. 228
Gras, W.J. 196
Gratzel, M. 193, 195
Green, A.K. 230
Gregory, R.P.F. 191
Grey, F. 228
Griffith, O.H. 192
Griffiths, K. 227, 229
Grimm, W. 229
Gromb, S. 356
Gros, M. 356
Gross, E.L. 191
Grunze, M. 230
Gruszecki, W.I. 196
Gruzalski, G.R. 230

Gundel, J. 196
Gust, D. 193
Gustafsson, T. 228

Haas, T.W. 231
Haase, J. 227
Hagins, W.A. 196, 197
Hajkova, P. 356
Halicioglu, T. 231
Hall, D.O. 193, 199
Hamers, R.J. 228
Hammer, L. 227, 228
Hanawa, T. 230
Hansen, R.S. 354
Hanson, G.V. 228
Harbich, W. 195
Hargrave, P.A. 196
Harima, Y. 199
Haroske, D. 196
Hattenbach, A. 196
Hayden, B.E. 228
Heckingbottom, R. 230
Hegeman, P. 198
Heinz, K. 227, 228, 229
Helfrisch, W. 195
Hellingwerf, K.J. 197, 198
Helmholz, H. 356
Helms, C.R. 229
Henglein, A. 195
Hengrasmee, S. 227
Hermann, G. 196
Hertrich, H. 228
Hesketh, T.R. 194
Heyn, M.P. 198
Hianik, T. 198
Higashiyama, K. 228
Higgins, J. 194
Hill, N.W. 191
Hiller, C. 228
Hills, G.J. 356
Himpsel, F.J. 228
Hinch, B.J. 227
Hirth, J.P. 226
Ho, T.-F. 193
Hoekstra, D. 195
Hofmanova, A. 196
Holland, B.W. 227
Holub-Krappe, E. 228
Homolka, D. 356
Honda, K. 192, 196
Hong, F.T. 194, 197, 198
Hopf, F.R. 193
Hopfield, J.J. 193, 195
Hopkins, B.J. 228
Horiguchi, T. 229
Horn, K. 228

Hotchandani, S. 195
Houle, A. 196
Housley, M. 230
Hsu, K. 195
Hu, W.Y. 231
Huang, C.C. 199
Huang, J.H. 228
Huang, Z.Q. 227
Huber, R. 194
Hudson, H. 197
Huebner, J.S. 191, 194, 198
Hui, K.C. 229
Hurley, J.K. 195
Hussain, Z. 227, 229
Hybertsen, M.S. 228

Ibach, H. 227
Ibbotson, D.E. 230
Idzerda, Y.U. 228
Ignatiev, A. 227
Ikegami, A. 198
Ilina, M.D. 196
Imbihl, R. 227, 228, 231
Inoccia, L. 228
Isa, S.A. 230
Ishikawa, T. 228
Itoh, M. 192
Iwami, M. 230
Iyota, H. 354

Jackman, T.E. 229
Jackowska, K. 199
Jackson, D.P. 229
Jacobsen, K.W. 229
Jadzyn, Cz. 192
Jaeger, R. 229
Jagodzinki, H. 230
Jamison, K.D. 228
Janssen, A.P. 229
Janzen, A.F. 192
Jasaitis, A.A. 196
Jaycock, M.J. 355
Jennings, G. 227
Jepsen, D.W. 227, 228, 229, 230
Johnson, L.B.-A. 193
Johnson, R.L. 228
Joly, Y. 227
Jona, F. 227, 228, 230
Jones, R.G. 230
Joran, A.D. 193
Joshi, N. 193
Joshi, N.B. 193
Joy, A. 193
Joyner, R.W. 226, 230
Jurata, N. 193

Kabomoto, N. 197
Kadoshnikov, S.I. 194
Kaduwela, A. 229
Kahn, A. 229, 230, 231
Kaibara, K. 192
Kakiuchi, T. 355, 356,
Kalamkarow, G.R. 193
Kaldor, A. 231
Kalyanasundaram, K. 193
Kamo, N. 198
Kanani, D. 230
Kandelaki, M.D. 192
Kaneshina, S. 354
Kano, K. 195
Kao, C.-T. 226
Kaplan, P. 231
Karvaly, B. 194, 197, 198
Katayama, I. 230
Kato, H. 229
Katz, J. 194
Kaufman, D.S. 227
Kaulen, A.D. 198
Kaupp, V.B. 196
Kawashima, T. 195
Kawazu, H. 228
Kay, R.E. 194
Kelemen, S. 229
Kendall-Tobias, M. 192
Keszthelyi, L. 197, 198
Khitrina, L.V. 198
Kikuta, S. 228
Kim, S. 227, 228
Kimizuka, H. 192
King, D.A. 227, 228, 229
Kirby, R.E. 231
Kirschfeld, K. 193
Kishimoto, U. 197
Kitajima, Y. 231
Kjaer, K. 228
Kleinle, G. 228
Knoll, W. 195
Knowles, A. 191
Knutsson, H. 197
Kobatake, Y. 198
Kobayashi, M. 356
Koch, K.-W. 196
Koenig, F.O. 355
Kohn, A. 229
Kohn, W. 226
Kokubo, T. 192, 194
Kolesnikov, S.S. 196
Komori, M. 196
Kong, J.L.Y. 193
Kongslie, K.F. 192
Konishi, T. 197
Kono, S. 228
Konrashin, A.A. 196
Korenbrot, J.I. 196
Korenstein, R. 195
Korpiun, P. 195
Kossi, C.N. 197
Kostelitz, M. 229
Kosugi, N. 231
Kouyama, T. 198
Koyama, Y. 196
Kozlov, M.M. 355
Krans, R.L. 228
Krasnovsky, A.A. 196
Krasnovsky, A.A., Jr. 194
Krischer, K. 231
Kubler, O. 193
Kugimiya, S.-I. 196
Kulak, A.I. 192
Kuln, H. 193
Kunz, C. 228
Kuppers, J. 229, 230
Kuroda, H. 231
Kurup, S. 192
Kutnik, J. 193, 196, 198, 199
Kwon, H.W. 196

Laane C., 194
Ladas, S. 231
Laeuger, P. 195
Laikhter, A.L. 198
Lamb, T.D. 196
Lambert, R.M. 230
Lander, J.J. 230
Lang, E. 229
Lang, N.D. 226
Langmuir, I. 226
Lanyi, J.K. 197, 198
Lapujoulade, J. 227
Larsen, H. 197
Latta, E.E. 229
Laueger, P. 194
Lauger, P. 198
Law, W.C. 195
Lazarova, C.R. 198
Le Brech, J. 195
LeBlanc, R.M. 195, 196, 197
Lecante, J. 228
Lee, A.G. 195
Lee, B.W. 227, 231
Lee, C. 231
Lee, Y.-I. 196
Légaré, P. 230, 231
Legg, K.O. 228
Legrand-Bonnyns, E. 231
Lehoczki, E. 192
Leikin, S.L. 355

Leland, R.A. 193
Lerebours, B. 192
Leung, K.T. 229
Leygraf, C. 229
Leysen, R. 230
Li, S.-J. 195
Li, Y.S. 227, 228, 230
Liddell, P. 193
Liebman, P.A. 197
Lien, S.C. 199
Lin, M. 356
Lin, R.F. 228
Lin, Z.D. 230
Lindauer, G. 231
Lindblom, G. 193
Lindroos, M. 228
Lippits, G.H.M. 230
Liu, G. 227
Liu, Q.Y. 193
Liu, Q.-Y. 197
Liu, T.M. 196
Loach, P.A. 193
Loew, L.M. 195
Loew, M. 198
Lojewska, Z. 195
Lojewska, Z.K. 196
Lok, C.K.C. 230
Longstaff, C. 197
Lopez, J.R. 193, 194, 196
Lorenz, W. 356
Losev, A. 196
Lou, J.R. 229
Louie, S.G. 228
Lu, S.H. 230
Luisetti, J. 195
Luke, K.L. 228
Lynbarsky, A.L. 196
Lyo, I.-W. 227
Lyubarskiy, A.L. 197

MacLeish, P.R. 197
Maglietta, M. 229
Maire, G. 230, 231
Mangel, M. 194
Mansoura, P. 356
Marchon, B. 226
Marcus, P.M. 227, 228, 229, 230
Marcus, R.A. 193
Mareček, V. 356
Markin, V.S. 198, 355, 356
Mårtensson, P. 228
Martin, J.L. 194
Martines, V. 229
Materlik, G. 228
Mathews, H.R. 196
Matschal, O. 195
Matsumoto, M. 192, 194
Matsuo, T. 195
Matubayasi, N. 354
Matuura, R. 354, 355
Mauzerall, D. 194, 196
McConnell, D.G. 197
McConville, C.F. 230
McIntosh, A.R. 193
McIntyre, P. 193
McKee, C.S. 231
McLaren, J.M. 227
Mechterscheimer, G. 231
Mei, W.N. 231
Meier, H. 199
Melnik, E.I. 196
Melrose, J.C. 356
Melroy, O.R. 355
Mendez, E.E. 192
Merrill, R.P. 229
Mettee, H.D. 196
Meutter, J.D. 196
Michel, H. 194
Migita, S. 193
Miki, K. 194
Milgrom, L.R. 193
Miller, N.G.A. 191
Miller, W.H. 197
Milne, R.H. 229
Mirsky, V.M. 196, 198
Misumi, Y. 193
Mitchell, D.F. 229
Mitchell, K.A.R. 227, 229
Mitchell, P. 193
Mitsner, B.I. 198
Miyasaka, T. 192
Miyazaki, J. 192, 194
Mohilner, D.M. 356
Mohwald, J. 195
Momenteau, M. 196
Montal, M. 197, 198
Moore, A.L. 193
Moore, T.A. 193
Moore, W.T. 229
Morina, M. 194
Moritz, W. 227, 228
Morrison, J. 230
Morse, M.D. 231
Motoki, H. 194
Motomura, K. 354, 355
Mountz, J. 199
Müller, E. 196
Müller, K. 227, 228, 230
Munck, D.K. 199
Munoz, M.C. 229
Murakami, M. 197

Murphy, R.L. 196
Murthy, A.S.N. 199

Nagamura, T. 195
Nahmias, S. 197
Nakache, E. 355
Nakamura, M. 354
Nakanischi, M. 356
Nakanishi, K. 195
Nakanishi, S. 229
Nakatani, K. 196
Nakatani, S. 228
Namba, H. 229
Nandy, P. 192
Nasuda-Kouyama, A. 198
Nataga, T. 193
Nava, F. 230
Neumann, A.W. 356
Neumann, S. 195
Nicholls, J.M. 228
Nicholls, P. 195
Nichtl, W. 227
Nicol, G.D. 197
Niehus, H. 228, 231
Nielsen, M. 228
Nikandrov, V.V. 194
Nishitani, S. 193
Nitschke, F. 230
Nomura, T. 195
Noonan, J.R. 230
Norman, D. 229
Norris, J. 194
Nørskov, J. 229
Northrup, L.E. 228
Norton, P.R. 229
Nosaka, Y. 199
Nosaki, H. 197

Oed, W. 227
Oesterhelt, D. 196, 198
Oettmeier, W. 194
Ogletree, D.F. 226
Ohki, S. 194
Ohta, T. 231
Ohtani, H. 226, 227
O'Brien, D.F. 196
Okada, N. 193
Okajima, T.L. 197
Okano, M. 192, 194
Onchi, M. 229
Onuferko, J.H. 227
Orent, T.W. 230
Ormos, P. 197, 198
Osterwalder, J. 229
Ostrovsky, M.A. 193
Ottaviani, G. 230
Ottolenghi, M. 195
Otvos, J.W. 194
Oudar, J. 229
Oura, K. 230
Ovenden, P.J. 356
Overbeek, J.Th.G. 355

Paate, J.M. 230
Pachori, P.M. 198
Packer, L. 197
Paffeit, M.T. 230
Pak, W.L. 197
Pan, R.L. 191
Pant, H.C. 194
Pantel, R. 229
Paolucci, G. 228
Paphadjopoulos, D. 191
Paquin, P. 196
Parfit, G.D. 355
Park, C.Y. 228
Park, R.L. 228
Parsons, R. 355, 356
Passler, M.A. 227
Paton, A. 229, 230
Pedersen, J.S. 228
Pendry, J.B. 227, 228, 229
Penka, V. 227, 228
Penn, R.D. 196
Pepe, I.M. 194, 197
Perdereau, J. 229, 231
Peruchetti, J.C. 230
Pessiki, P.J. 193
Petrii, O.A. 355
Phaneuf, R.J. 227
Phondke, G.P. 194
Pileni, M.P. 192
Piquard, G. 230
Pirri, C. 230
Plagge, A. 230
Plummer, E.W. 227
Poelsema, B. 231
Pollard, W.T. 197
Ponslet, A. 231
Popp, A.E. 198
Poppa, H. 231
Porter, G. 193
Pound, A.M. 226
Prigogine, I. 226
Prince, K.C. 228
Prior, K.A. 230
Puchta, W. 227
Puga, M.W. 231
Pugh, E.N. 197
Pugh, E.N., Jr. 196
Puschmann, A. 227
Putninskii, A.V. 196

Quina, F.H. 193
Quinn, J. 230

Rafferty, C.N. 197
Raghavachira, K. 228
Rando, R.R. 195, 197
Raveed, D. 195
Rawlings, K.J. 228
Rayfield, G.W. 196
Reddy, K.S. 199
Reed, A.P.C. 230
Regen, S.L. 195
Reichman, J. 192
Reid, J.D. 355
Reimer, W. 227
Reiss, C. 228
Rhead, G.E. 229, 231
Rhodin, T.N. 228
Rich, M. 196
Richardson, N.V. 229
Riedel, E.K. 227
Rieder, K.H. 231
Riketts, M. 197
Robello, M. 197
Robert, S. 196
Roberts, M.W. 230, 231
Robey, S.W. 227, 229
Rolandi, R. 197, 199
Ross, P.N. 229
Rossi, G. 228
Rotenberg, Y. 356
Rotermund, H.H. 227
Roubin, P. 228
Rous, P.J. 227, 228
Rousseau, J. 229
Rowe, J.E. 229, 230
Rowlinson, J.S. 355
Ruppel, H. 197
Rusanov, A.I. 354, 355, 356
Ruysschaert, J.-M. 196

Sacedon, J.L. 229
Sachtler, W.M.H. 230
Sagurton, M. 229
Saiki, R. 229
Sakai, T. 196
Sakama, H. 228
Sakisaka, Y. 229
Salamon, Z. 199
Salanon, B. 227
Saldin, D.K. 227, 228
Salmeron, M. 226, 231
Samec, Z. 356
Samuilov, V.D. 196
Saris, F.W. 230
Sasaki, H. 192
Schach, A.E. 227
Schadt, M. 197
Schwartzentruber, B.S. 228
Schiffrin, D.J. 355
Schmidt, L.D. 231
Schmidt, W. 195
Schneke, W. 195
Schoonmaker, R.C. 229
Schreckenbach, T. 197
Schreiber, B. 192
Schrott, A.G. 231
Schwaha, K. 230
Schwartz, S.B. 231
Scully, S. 198
Seelich, F. 355
Seibert, M. 192
Semenova, A.N. 194, 196
Senda, M. 355, 356
Senf, F. 228
Senvarima, C. 192
Sepulveda, A. 229
Seta, P. 193, 196, 197, 198, 199
Severina, I.I. 198
Shank, C.V. 197
Sharma, R.K. 192
Sheng, T.T. 230
Shi, A.-C. 231
Shieh, P.K. 194, 197
Shih, H.D. 227, 230
Shin, D.H. 196
Shiomi, K. 196
Shirley, D.A. 227, 229
Shkuropatov, A.Y. 192
Shoji, F. 230
Shubin, L.M. 192
Shuh, D.K. 228
Siekhaus, W. 226
Sielewiesiuk, J. 196
Silva, F. 356
Simmons, G.W. 229
Simpson, L. 198
Singh, A. 195
Sistram, W.R. 194
Skottke, M. 227
Skulachev, V.P. 196, 198
Skuta, A. 196
Smalley, R.E. 231
Smeenk, R.G. 230
Smit, L. 228
Smith, A.H. 227
Smith, H.P., Jr. 230
Smith, R.L. 230
Sodhi, R.N.S. 227
Sokolov, J. 227

Sokolov, V.S. 196, 198
Somorjai, G.A. 226, 227, 229, 230, 231
Soria, F. 229
Sotto, M. 231
Spencer, N.D. 230
Sprintschnik, S. 193
Srinivasan, S. 230
Srivastava, R.C. 192, 198
Stark, G. 195
Steinbrunn, A. 230
Steinemann, A. 195
Stern, J.H. 197
Stillman, M.J. 192
Stillwell, W. 194, 195, 197
Stoeckenius, W. 191, 198
Stöhr, J. 227, 229
Stolovitsky, Yu.M. 194
Storjohann, I. 228
Strauss, G. 194
Strongin, D.R. 231
Strongin, M. 229
Stryer, L. 196
Sudholter, E.J.R. 195
Sudigara, M. 194
Sudo, Y. 195
Sugimato, T. 194
Sugimoto, T. 192
Sunamoto, J. 195
Suzuki, N. 192
Suzuki, S. 192, 197
Sviridov, D.V. 192
Szabad, J. 192, 194
Szabo, G. 198
Szalaly, L. 192
Sze, S.M. 192
Szoka, F. 191

Tabushi, I. 196
Takagi, M. 197
Takahashi, F. 192
Takahashi, T. 198
Takahasji, T. 228, 229
Takayangi, T. 195
Takiguchi, H. 229
Takuma, K. 195
Tancrede, P. 196
Tandon, A. 192, 198
Tanimoto, S. 192, 194
Tasaki, I. 194
Tatake, V.G. 194
Taylor, J.L. 230
Taylor, T.N. 230
Terminello, L.J. 227
Theilen, U. 195
Thiel, P.A. 228, 229, 230
Thomas, J. 194
Thompson, K.A. 231
Thompson, W.A. 228
Thundat, T. 228
Tian, D. 230
Tien, H.G. 198
Tien, H.T. 191, 192, 193, 194, 196, 197, 199
Titov, A.V. 230
Tobin, J.G. 227
Toda, F. 195
Tollin, G. 194, 195
Tomioka, H. 198
Tomita, T. 197
Tomkiewicz, M. 194
Tomono, S. 197
Tong, S.Y. 231
Toyoda, J. 197
Toyoshima, Y. 194
Trasatti, S. 356
Trevor, D.J. 231
Tripathy, A.K. 192, 199
Trissl, H.-W. 192, 194, 198
Troesper, T. 195
Tromp, R.M. 228, 230
Tsutsui, Y. 195
Turner, J.E. 231
Tysoe, W.T. 230

Ueno, A. 192
Ulrich, H.-M. 193
Umbach, E. 227
Unertl, W.N. 229
Usui, Y. 195

Vacek, K. 196
Vaillar, J.-G. 192
Valent, O. 196
Valeri, S. 230
Van Dam, K. 197, 198
van der Veen, J.F. 227, 228, 230
Van Hove, H. 230
Van Hove, M.A. 226, 227, 229
van Loenen, E.J. 228, 230
Verma, S.P. 193
Verschaffeit, J.E. 355
Vickers, J.S. 228
Viswanath, Y. 231
Vitomirov, I.M. 230
Vodyanoy, I. 198
Vodyanoy, V. 198
Volkov, A.G. 192, 355, 356
von Wittenau, A.E. Schach 227, 229
Vozar, L. 198

Vurens, G.H. 231
Vvedensky, D.D. 227, 228

Waggoner, A.S. 198
Wagner, C. 355
Walz, D. 195
Wang, C.B. 193
Wang, H.-C. 228
Wang, S.R. 231
Wang, S.W. 226
Wang, T. 231
Wang, X. 228
Wang, Z.Q. 227, 228, 230
Warashina, A. 194
Watanabe, T. 192
Watson, P.R. 226, 227
Waugh, K.C. 230
Weaver, J.H. 228, 230
Webb, W.W. 198
Wehrli, E. 193
Wei, L. 199
Weinberg, W.H. 227, 228, 230
Weller, H.G. 194
Wenzel, L. 227
Werson, W. DuPre 195
Wesphal, D. 227
West, J. 195
Whetten, R.L. 231
Whitney, R.W. 356
Whitten, R.D. 193
Widom, B. 355
Wieslander, A. 193
Wikandrov, V.V. 196
Williams, E.D. 227, 228
Williams, R.S. 228
Willis, R.F. 227
Wilson, J.M. 229, 230
Wilson, R.J. 228
Wintterlin, J. 228
Withrow, S.P. 228
Witt, H.T. 195
Wood, P.R. 230
Woodle, M.C. 196
Woodruff, D.P. 227, 230
Worthington, C.R. 196
Worthy, W. 199
Wovschall, D. 198
Wrobel, D. 196
Wu, N.J. 230
Wu, S.C. 228, 230

Xiao, K. 199
Xu, F. 230
Xu, G. 231

Yalisove, S. 228
Yamanaka, M. 354
Yamauchi, A. 192
Yamshita, K. 199
Yang, W.S. 230
Yarmoff, J.A. 228
Yau, K.-W. 196
Yeates, R.C. 231
Yeh, J.L. 231
Yoon, M. 196
Yoshikami, S. 196

Zaera, F. 231
Zanazzi, E. 229
Zeng, H.C. 227
Zewail, A.H. 193
Zhang, C. 229
Zhang, X.S. 227
Zhou, M.Y. 229

SUBJECT INDEX

Adsorption equations
  Gibbs method 241-250
    alternatives to 250-255
    components distribution in 246-250
    equation in 244-246
    reference system in 250-254
  Gibbs-Duhem 243-244, 255, 258-259
    symmetrized form of 265-266
  Hansen method and 257-260
    symmetrized form of 266-267
Association 19

Bacteriorhodopsin (BR)
  in **H. halobium** BLM 167-169
  in **H. halobium**, phototransduction 146, 162-166
Bilipid membranes (BLMs). See also Pigmented bilipid membranes
  bacteriorhodopsin-containing, photoresponse of 106, 107-108, 107-108
  carotenoid 133-134
  chlorophyll-containing, photoresponse of 106-107, 111-114
  dye-sensitized 169-171, 173
    aromatic amino acid 171-172
    cyanine 170
    cyclic voltammetry technique and 172
    p-aminostyrylpridium-ASP 171
    PBLM-dye interactions 172-173
  formation from liquid crystals 175-177, 180
    cyanobiphenyl materials and 179
(Bilipid membranes, cont.)
    light effect on 178-179
    phases of 175
    thermotropic crystals 177-178
  formation of 8-9
  inorganic semiconductors in 173-175
  light-induced effects in 144-145
  with P-C linkage, photoresponse of 45-52
  with P-Q linkage, photoresponse of 109-111
  PS-I reconstitution into 114-118
  rhodopsin-containing 143
BLMs. See Bilipid membranes
Bond breaking, adsorbate-induced restructuring and 225-226
Boundary definition, Gibbs 243
BR. See Bacteriorhodopsin

Carotenoids
  bilayers of, action spectra 138-144
  in BLMs 133-134
  PBLM photoelectric effects and 86
Charge separation/transfer, in P-Q complexes 51-52
Charge transfer, in biomolecules 12-13
Chlorophyl a, PBLM photoelectric effects and 71-72, 76-77
Chlorophyll, in PBLMs 90-92, 96, 97
Chlorophyll aggregates
  fluorescence spectroscopy and 103-106
  photoelectrospectrometry and 99-101
Chlorophyll and derivatives
  in PBLMs 90-92, 96, 97

Chlorophyll molecules, photovoltaic spectroscopy and 101-103
Clean surfaces, nature of 204-205
Clusters, adsorbate reshaping of 221-222
Components
  distribution of in Gibbs method
    nonoverlapping 246-248
    overlapping 248-250
  estimation of and phase rule 307-309
Compound formation
  adsorption-induced 212-217
    carbides 217
    nitrides 217
    oxidation 212-214
    oxides 216
Criterion of force, Gibbs reference system 250-254
Crystallites
  formation of compound 219
  recrystallization 219-220
Curved surfaces
  Hansen method applied to 293-299
  reference systems and
    Gibbs 300-301
    Hansen 301-302
Cyanine dyes, PBLM photoelectric effects of 85

Dipole model, phototransduction PBLMs 42-43
Dissociation 19
Dividing surface
  cuvature changes in 256
  force and adsorption conventions and 250-255
  Gibbs method 239, 243, 245-247, 257

Electrical detection, in BLMs 9
Electrocapillarity
  equation for 310
    in Hansen's representation 318-322
  Gibbs vs. Hansen and 239-241
  thermodynamic theory of 239
Electromotive force (EMF) of circuit 322-324
Electron transfer
  light-induced 43-52
(Electron transfer, cont.)
    chloroplast and carotenoid doped 46-47, 49
    photosynthesis and 43-44
    P-C doped 47, 49-52
    P-Q complex and 47-52
Electron transport, PBLMs and 94-96
EMF. See Electromotive force
Energy transfer processes 16
Excited state, fate of 14-16

Fluorescence quenching in P-Q complexes 51-52
Frumkin surface excesses
  definitions of 273-274
  Gibbs excess and, relative 273
  in two-phase system 272-275

Gibbs, interface surface description 277-278, 289
Gibbs method
  adsorption equation in 244-246
    Guggenheim method and 290-291
    in Hansen's electrocapillary equation 318
    independent variables and 312
  curved surfaces and 300-301
  dividing surface and 239, 243, 245-247
  energy, two-phase system 241-242
  Gibbs-Duhem equations and 243-244, 255, 258-259
  Guggheim method and 290-291, 312, 318
  reference systems and 238, 243, 248-250
Gibbs-Duhem equations
  Gibbs and 243-244
  Hansen method and 255
  independent variables and 315
  mole fraction expression of 270-271
Gibbs-Hansen parameters relationship
  adsorption equations in 262-263
  correlation between 263-265
  excesses of, relative 260-262

(Gibbs-Hansen, cont.)
volume excesses and 263-264
Guggenheim method
Gibbs equation and 290-291, 312, 318
Hansen's equation and 291-292

H. halobium. See **Halobacterium halobium**
Halobacterium halobium
purple membrane 145-146
flash excitation of PM-BLMs and 158-162
HR in 166-167
incorporation of PM 153-154
membrane composition and supramolecular organization of 146-147
photocycle of 149-150
photoeffects in PM-BLM 154-156
phototransduction mechanism and photocycle 147-158
properties of 147-149
reconstitution experiments 151-153
spectroscopy of PM-BLM 156-158
Halorhodopsin (HR) 147
in **H. halobium** BLM 166-167
Hansen method
adsorption equation 266
binary system and 302
curved surfaces and 293-300
Gibbs reference system and 300-301
Hansen reference system and 301-302
Gibbs and 243, 245, 257-258
Gibbs-Duhem equations and 243-244, 255, 258-259
Guggenheim method and 291-292
interpretation problems in 292-293
reference system in 253, 255-260
determining conventions of 256-257
phase volumes in 259
surface excesses in 255, 257-259
relative excesses in 315
surface volume excess in 255-256, 259

(Hansen, cont.)
volume calculation in 281-283
Hansen representation, electrocapillary equation
charge determination in 332-333
EMF of circuit and 322-324
final form of 324-326
generalization to indicator ion combination 326-327
Gibbs equation in 318
salt in, incomplete dissociation of 327-328
surface reactions in 331-332
boundary of two phases 328-332
Gibbs equation and 329-330
HR. See Halorhodopsin

Independent variables
binary salt solutions and, neutral 313-314
choice of 312-318
degrees of freedom 310, 313
estimation of, two-phase system 308-310
Gibbs equation and 312
Gibbs-Duhem equation in, two-bulk phases 315
surface excesses estimation and 315-318
system components and 313
Interface formation
binary system 279-280
entropy of 283-284, 289
Gibbs description 277-278, 289
specific volume 275-276
surface characteristics and 276-277
surface excess elasticity and 284-286
ternary two-phase system 281-283
volume calculation, Hansen method 280-281
Interfaces
charge determination in 332-333
curved and flat 310-311
electrode/electrolyte 23
entropy of 283-284, 289
flat 309-310

(Interfaces, cont.)
of immiscible solutions 327-328
membrane/solution 23-24
Schottky barrier model 24-25, 26
nonpolarizable 307, 336-338, 344-352
polarizable 307
example of 340-344
ideal 334-335, 339
perfectly 334-335, 338-339
properties elucidation and 237-238
reversible 336-338
spherical 245
surface excesses of charge and 333-334, 339
TBATPhB in nb and LiCl in water 340-344
Ionization 19
Ions, indicator, electrocapillary equation 326-327

Light and matter as particle waves 11-12
Lipid microvesicles (LMV). See Liposomes
Liposomes
formation of 8-9
fusion with PM-BLMs 154-156
pigmented
chlorophyll and derivatives in 90-92, 96, 97
electron transport and 94-96
energy transfer in membranes and 96-97
fused with oxygen-evolving complexes 93-94
pH dyes in 97
LMV (lipid microvesicles). See Liposomes

Magnesium mesoporphyrin
PBLM photoelectric effects and 81-82
Mediator substances 120, 122
Membrane solutions
energetics of interface 24-31
Schottky barrier model and 24-25, 26
junctions of 23-24

(Membrane solutions, cont.)
as redox reaction sites 31-33
Membrane spectroscopy
absorption spectrometry 98-99
fluorescence spectroscopy 103
photoactive species and 98
photoelectrospectrometry 99-101
photovoltage spectroscopy 101-103

Opsin, 123, 124. See also Rhodopsin
Oxygen-evolving complexes
fused with PBLMs 93-94
kinetics of 92-93
Kravonsky reactions and 93, 94
thylakoid membranes and 93-94

Particles, wave nature of 12
PBLMs. See Pigmented bilipid membranes
P-C complexes. See Porphyrin-carotene
Phase rule 306-312
component estimation and 307-309
curved and flat interfaces and 310-311
flat interfaces and 309-310
general case 309-310
restrictions on 307-309
independent variable estimation, two-phase system 308-310
interfacial potential difference variation in 306, 310-312
for phase interfaces 306
polarizable and nonpolarizable interfaces 307
redox reactions and 311-312
Phosphatidylcholine liposomes, energy transfer in 97
Photochemical processes in thylakoid membrane 62-65
Photochemical reactions 18-22
Photochemistry, Einstein's law of 12
Photoconversion 10

Photoelectric effects
  across BLM 36-37
  light transduction mechanisms of 35-40
    dipole model 42-43
    electrical field effects across BLM 36
    redox electrode model 40-42
  of membrane 33-35
  in PBLM systems 38-39
  radiation and 11, 13
Photoelectric effects of PBLMs
  bilipoproteins and 74, 75
  carotenoids and 86
  chlln BLM system 84-85
  chlorophyl a 71-72, 76-77, 86-87
  chlorophyll molecules and 66, 67, 86
  chloroplast extract and 69-70, 72-73
  cyanine dyes and 85
  dyes and 70, 77
  excitons and 77-79, 81
  flash studies, and kinetic determination 81-82, 84
  KI and I_2 68-69
  light pulses 83-84
  light source and 66-67, 69
  magnesium mesoporphyrin molecule 81-82
  oxidant polarity and 75-76
  pH 70-71
  photogalvanic 65
  photosensitive ions 67-68
  photovoltaic 65, 68
  phycocyanin and 73-74, 76-77
  pigment interaction and 85-86
  redox conditions and 77
  temperature and photopotential and 67, 69
  TLM vs. 80-81
  tunnel voltage clamp circuit 83
Photoelectric energy conversion process 63
Photoelectric responses
  BLM P-C complex incorporation 51
  BLM P-Q complex incorporation 47, 49-52
  photo-induced electron transfer 43-52
Photoisomerization 19
Photophosphorylation, in photosynthesis 54-57
Photophysics and photochemistry
  laws of 11-12
  time scale for 17-18
Photoreceptor membranes 119-122. See also Visual process
  carotenoid bilayer action spectra 138-144
  carotenoid BLM observations 133-134
  dark membrane potentials and 134-135
  light-induced effects, BLMs 144-145
  photoresponse
    description of 135-138
    temperature effect on 139-143
  reconstitution of 131, 133
  rhodopsin-containing BLMs 143
Photoreceptors
  biochemical aspects of 125
  early receptor potential of 125-126
  evolution of 122
  membrane properties on illumination 126-127
  photobiochemical aspects of 123
  rhodopsins in 123, 124, 125, 126
  structure of 123-125
Photoredox processes 19, 20-22
Photoresponse
  description of 135-138
  temperature effect on 139-143
Photosensitization 10
Photosynthesis 58
  artificial
    natural semiconductor model of 181-184
    PBLMs in polycarbonate filters 184
    polycarbonate membrane semiconductor electrochemical photocells 184-186
    SC-SEP 186-191
  biochemical reactions in 56

(Photosynthesis, cont.)
chloroplasts in 57
electron transfer in 43-44
electron transport and 94-96
photochemical reactions in 56
photophosphorylation in 54-57
research 6
Niels' equation and 54
period I 53-54
period II 55
period III 55-57
thylakoid membrane in 53-61
vision and 62
Phototransduction mechanisms 127, 132
by pigmented BLM 26-28
membranous structures in 127
in PBLMs 40-42
rhodopsins in 127-131
Phycocyanin-doped PBLMs
photoelectric effects of 73-74, 76-77
Pigmented bilipid membranes (PBLMs)
chlorophyll molecules, aggregated 87-88
effect of light and 88-89
electron transport and 94-96
lipid molecule structure 87
as model of energy transduction and photochemical processes 62-65
p- and n-type 26-28
photocurrents of
sustained 90
transient 89-90
photoelectric effects of 24, 64-90
photoelectric energy conversion process and 63
photosynthesis and vision and 62
phototransduction in 40-42
photovoltaic cell and 29-31
thylakoid membrane and 61-90
TLM vs. 63
PM (Purple membrane)
PM-BLMs. See Purple membrane-bilipid membranes
Porphyrin-carotene (P-C) complexes
BLM photoresponse to 47-52
Porphyrin-quinone (P-Q) complexes
BLM photoresponse to 47-52, 109-111
P-Q complexes. See Porphyrin-quinone
Purple membrane (PM)
incorporation of in **H. halobium** 153-154
Purple membrane bilipid membranes (PM-BLMs)
electrical circuit for 158-159
flash excitation of
dipole voltage and 160-161
equivalent circuit and 158-160
liposome fusion with 154, 156
photoeffects of 154-156
spectroscopy of 156-158
absorption spectrum of 156-157
photovoltage spectrum of 156-157

Radiation, electromagnetic 11
Reconstruction, adsoprtion-induced
adsorbate bond breaking and 225-226
change of 209-212
compound formation and 212-217
controlled reactions of 225
creation of 209
effect of, on active sites 224-225
mechanisms of 222-224
removal of 209
resulting structure, nature of 210-211
structure-insensitive 225
surface segregation and 218
time scales of 224
Redox electrode model
phototransduction in PBLM 40-42
one-photon process 40-42
two-photon process 42
Redox reactions
membrane sites for 31-33
photoelectrolysis-induced 32-33
Reference systems
dividing surface and 254-255

(Reference systems, cont.)
force and adsorption criteria in 250-254
Gibbs method 238, 243, 248-250
curved surfaces and 300-301
Hansen method 253, 255, 301-302
curved surfaces and 293-299
Reshaping, adsorption-induced. See also Reconstruction
of clusters 221-226
compound cystallite formation 219
recrystallization 219-221
stepped surfaces restructuring and 218
Rhodopsin. See also Bacteriorhodopsin (BR); Slow-rhodopsin (SR) pigments
in BLMs 143
in photoreceptors 123, 124, 125, 126
in phototransduction 127-131

SC-SEP. See Semiconductor septum electrochemical photovoltaic cells
Semiconductor septum electrochemical photovoltaic (SC-SEP) cells
in artificial photosynthesis 186
description of 187-189
ester photolysis via 189-191
SR (Slow-rhodopsin) pigments 147
Stepped surfaces, adsorption reconstruction of 218-219
Suface excesses
conversion of between systems 268-269
curved surfaces and 300-301
elasticity of 284-286
equation for, mole fraction of components and 269-271
estimation of 315-318
Frumkin and 271-275
Gibbs method 243, 245, 257-258

(Surface excesses, cont.)
Gibbs-Hansen relationship 260-262
Hansen's method 255, 257-259
independent variables and 315-318
interface charge and 333-334
Overbeek and 274
symmetrical 267-268
Surface formation characteristics 276-277
Surface reactions
boundary of two phases 328-332
Gibbs equation and 329-330
interface charge determination in 332-333
Surface relaxations
adsorption and 205-208
parallel 208
perpendicular 205-206

Thermodynamic charge calculation, (TAA+TPB-) in nb phase 352-353
determination of in interface 332-333
Thin lipid membranes (TLMs)
PBLMs vs. 63
Thylakoid membrane
chloroplasts in 57
composition of, chemical 59
membrane spectroscopy and 98-118
molecular organization 60
oxygen evolution and 93-94
PBLMs and 61-90
pigmented liposomes and 90-97
structure of 57-59
TLMs (Thin lipid membranes) 63
Transduction. See also Phototransduction
electromagnetic energy 21

Visual process
eye, gross anatomy of 119-121
photomembrane reconstitution, models 131-145
photoreceptor membranes in 119
mediator substances and 120, 122
rod cells 119-129, 124

(Visual process, cont.)
photoreceptors in 122-127
phototransduction mechanisms in 127-131
Volume
excess
curved surface and 300
Gibbs 256, 259
Hansen 255, 257-259
(Volume, cont.)
specific
in binary system 279-280
Gibbs description 277-278, 289
Hansen calculation of 280-281
ternary two-phase system 281-283
surface formation and 287-288, 290